The relationship between ethnicity and service access, treatment uptake and the incidence of psychosis among people at Ultra High Risk for Psychosis.

Majella Byrne[a,b,*], Louisa Codjoe[b,c], Craig Morgan[c], Daniel Stahl[d], Fern Day[a], Paul Fearon[e], Paolo Fusar-Poli[b,f], Paddy Power[e], Philip McGuire[b,f], and Lucia Valmaggia[a,b]

A. Department of Psychology, King's College London, Institute of Psychiatry, Psychology and Neuroscience, United Kingdom

B. South London and Maudsley NHS Foundation Trust, United Kingdom

C. Health Service and Population Research, King's College London, Institute of Psychiatry, Psychology and Neuroscience, United Kingdom

D. Biostatistics & Health Informatics, King's College London, Institute of Psychiatry, Psychology and Neuroscience, United Kingdom

E. St Patrick University Hospital and Trinity College Dublin, Ireland;

F. Department of Psychosis Studies, King's College London, Institute of Psychiatry, Psychology and Neuroscience, United Kingdom

*Corresponding author: Dr Majella Byrne, King's College London, Institute of Psychiatry, Psychology and Neuroscience, Department of Psychology (PO 77), De Crespigny Park, SE5 8AF London, United Kingdom, E-mail: Majella.Byrne@kcl.ac.uk

Total words abstract: 195

Total words (excluding abstract, table, figure and references): 3,417

Number of tables: 4 tables

Abstract

Black ethnicity is associated with increased risk for psychosis in South London. This study explored the distribution of ethnicity among services users at ultra high risk for psychosis (UHR) and examined the influence of ethnicity on service access, treatment uptake and incidence of psychosis. The ethnic distribution of 228 people at UHR for psychosis, seen in an early detection clinical service over 10 years, was compared with 146 people with first episode psychosis from the same geographic region and census figures for the local population. Black service users were significantly over-represented in the UHR group compared to the background population (34% vs 21%; $p<0.05$); but less so than in the first episode sample (58% vs 19%; $p<0.05$). Within the UHR sample, there was no strong evidence of differences between ethnic groups in the types of treatment provided, nor in the rate of transition to psychosis over 2 years. The absence of differences between ethnic groups in rates of transition to psychosis raises the possibility that access to mental health care at the high risk stage might have reduced the influence of ethnicity on the incidence of psychosis in this sample. This would need to be replicated in a larger sample.

Keywords

Ethnic minority; Psychosis; Early Intervention; Ultra High Risk; Transition

1. Introduction

Higher rates of psychosis spectrum disorders have been reported among migrant populations in European countries (Cantor-Graae and Selten, 2005a; Hjern et al., 2004a; Leao et al., 2006) and in black Caribbean (Tortelli et al., 2015) and black African populations living in England (Kirkbride et al., 2012; Kirkbride et al., 2017) compared with host populations (Fearon et al., 2006; Harrison et al., 1997). For black service users in the UK, the pathway to mental health care is more likely to include contact with the police, referral from the criminal justice system (Ghali et al., 2013; Health Care Commission, 2006; Morgan et al., 2005b), a low level of general practitioner involvement (Anderson et al., 2014; Morgan et al., 2005b), a greater use of compulsory admission (Davies et al., 1996; Gajwani et al., 2016; Harrison et al., 1989; Morgan et al., 2005a; Rwegellera, 1980), and a longer duration of hospital admission (Commission for Healthcare Audit and Inspection, 2007). Whilst the overrepresentation of black service users within psychosis services is widely recognised, how to improve pathways to care is less clear (Moffat et al., 2009). The impact of stigma towards mental illness and mental health services as a barrier to accessing mental health care in black communities and how to address this is of growing interest (Henderson et al., 2012). It has also been identified that relative to white service users, service users from ethnic minorities were less likely to be offered a range of evidence-bases treatments for psychosis including pharmacological and psychological interventions, as well as involvement in care planning (Das-Munshi et al., 2018). Consequently, improving access to early detection services that are well integrated into the community, increased involvement of primary care, and equal access to psychological treatment were among the recommended changes to improve the mental health services and outcomes for black communities in the UK (Sainsbury Centre for Mental Health, 2002).

Outreach and Support in South London (OASIS) is a clinical service for young people at ultra high risk (UHR) of developing a first episode of psychosis in South London. The local population in this

area has both a high incidence of psychosis and a high proportion of people from ethnic minorities, particularly black service users, in whom the risk of psychosis may be up to 5 times higher than in the white population (Fearon et al., 2006; Tortelli et al., 2015). OASIS aims to facilitate early access to mental health care through an open referral system, active outreach and service promotion work including training for general practitioners and liaising with voluntary services, a prompt response time to referrals, location in an environment intended to be non-stigmatising, and provision of case management, medical and psychological treatments (Broome et al., 2005; Fusar-Poli et al., 2013).

The study aimed to examine whether black service users were over-represented in those at UHR for psychosis engaged in a specialist early detection service in South London, similar to what has been described among samples of people with established psychosis. The study examined the influence of ethnicity on pathways into the service, provision and uptake of treatment, and subsequent transition to psychosis.

We sought to explore the following:

1. Are black service users over-represented among people at UHR for psychosis similarly to people with a first episode of psychosis, compared to the local background population?
2. When offered treatment, do people from black and minority ethnic groups at UHR engage in the same way as white British service users?
3. Are there differences in the rates of transition to psychosis over a two year period among the different ethnic groups?

2. Methods

2.1. Recruitment of individuals at UHR

The OASIS team covers a wide urban area in South London (Fusar-Poli et al., 2013). It is fully integrated into the first episode services in the local area (Southwark, Lambeth, Croydon and Lewisham). To encourage referrals to the service, OASIS engages in community education and promotion programmes, which aim to educate a wide audience about the at risk mental state for psychosis and how to refer to the service. This has included engaging with a range of community organisations for example, schools and colleges, GPs, religious organisations, accident and emergency clinicians, job centre employees, and the police. OASIS accepts referrals from any source, including self-referrals. After referral to the service, people are contacted and offered an assessment with the team. If they agree, they are administered the Comprehensive Assessment of At Risk Mental State (CAARMS) (Yung et al., 2005). All people meeting criteria for an at risk mental state on the CAARMS are accepted by the team and offered intervention. Individuals at UHR for psychosis, accepted into the Outreach and Support in South London (OASIS) service between 2001 and 2010, were included here. OASIS offers intervention and support for up to two years, to people aged 14 to 35 years at UHR including practical and social support and information about their symptoms, cognitive behaviour therapy (CBT) by trained therapists as a first line treatment in accordance with National Institute for Health and Care Excellence (NICE) guideline recommendations (National Institute of Health and Care Excellence, 2014), medication where appropriate and regular medical review. For ethical reasons, and in line with common practice in UHR services, only help seeking individual are included (Corcoran, 2016).

The study received ethical approval by the ethical committee of the South London and Maudsley NHS Foundation Trust (study approval number 195/02).

2.2 Groups

2.2.1 UHR group

UHR was defined according to PACE criteria (Yung et al., 1998) as assessed using the Comprehensive Assessment of At Risk Mental State (CAARMS) (Yung et al., 2005), which has excellent validity and reliability (Yung et al., 2005). The onset of psychosis in the OASIS group was defined prospectively, using the criteria for transition to psychosis in the CAARMS (Yung et al., 2005). A first-episode diagnosis of psychosis was made by a member of the clinical team and confirmed by the team psychiatrist using CAARMS criteria. The diagnosis of first-episode psychosis was confirmed by accessing the electronic clinical records of each patient after their transfer from OASIS to a local first-episode team. All people meeting criteria for UHR who presented to OASIS between June 2001 and April 2010 were included (*N*=228).

2.2 2 First episode group

Ethnicity data on 146 people with a first episode of psychosis (FEP) were included, none of whom had ever been engaged with the OASIS team. The FEP sample comprised all patients presenting to local mental health services between June 2003 and August 2005 for the first time with a FEP who were referred to the Lambeth Early Onset Crisis and Assessment Team (LEO-CAT) (Craig et al., 2004; Power et al., 2007), an early intervention team for people with a FEP Lambeth, South London. The original sample included 150 people with FEP and formed the basis of an evaluation of the impact of GP training about FEP on number and speed of referrals to the early intervention services (Craig et al., 2004). To maximise comparability to the OASIS sample, we have included only those aged 16-34 years (146) who had not attended OASIS prior to the diagnosis of FEP (3 of the sample of 150 had been referred by OASIS, one was aged 35). FEP was also diagnosed using the CAARMS (Yung et al., 2005).

2.2.3 Local population

The ethnic distribution of the local population was taken from the 2011 Census (http://www.ons.gov.uk/census/2011census).

2.2.4 Comparison across the UHR, FEP and general population data

The UHR group were aged between 14 and 34 years, while the FEP group were aged between 16 and 35 years. To maximise comparability of the samples for the analysis comparing the UHR, FEP and general population data, only those aged 16 to 34 years were included. Only people from the London Boroughs of Southwark and Lambeth were included in the analysis comparing the UHR group to the general population as they formed 96% of the sample and these Boroughs have similar demographics. When comparing the FEP to the background population, only data for Lambeth were included because the FEP sample was exclusively from this region. To examine hypotheses two and three regarding ethnic differences in treatment and transition to FEP, the total OASIS sample (*N*=228) was included in the analyses. The UHR group was identified between June 2001 and April 2010, the FEP sample was identified between June 2003 and August 2005. The general population data used for comparison was from the 2011 UK Census.

2.3 Assessment measures

The CAARMS was used to identify co-morbid psychopathology (Yung et al., 2005). The Global Assessment of Function (GAF) (Endicott et al., 1976b) was used as a measure of social functioning at assessment.

2.4 Definition of ethnicity

Ethnicity in both the UHR and FEP samples was self-ascribed according to the South London and

Maudsley NHS Trust ethnicity codes. The following descriptions were presented to people to endorse: White British, White Irish, White European, Other White; Black or Black British, Black African, African Caribbean; Asian, Asian British, Indian, Pakistani, Bangladeshi, East African Asian, and other South Asian; Mixed ethnicity (any mixed race); Other ethnicities: Chinese and other East and Southeast Asian. In view of the relatively small sample sizes, ethnicity was recoded to form four broad categories of ethnicity: Black (including Black African, Black Caribbean, and Black British), White British, White Other (including White Irish, White European, and all other white), and Other (including those with mixed ethnicity, Asian, and middle eastern backgrounds). To examine the rate of transition to psychosis in the UHR group according to ethnicity, two definitions of ethnicity were analysed separately; the narrow four category definition of ethnicity (Black, White British, White Other, and Other) and an extended seven category definition of ethnicity (Black British, Black African, Black Caribbean, White British, White Other, Mixed, and Other), which could offer insight into any differences in rates of transition in different black ethnic groups.

2.5 Transition to psychosis

The UHR group received 2 years of support from the OASIS service. All people were offered case management, psychological therapy, medication consultation and medication if required, and monitoring of their mental health over a two-year period from the date of referral to the service. During this two-year period, OASIS had close contact with GPs and other agencies involved in the person's care. Approximately 12% of patients disengage from the service (Fusar-Poli et al., 2013). For those who were no longer in contact with the service at the end of the two-year follow-up period, electronic patient records are examined for evidence of transition to psychosis. We recently carried out a follow-up study (Brandizzi et al., 2015) (median length of follow-up 4 years) and we were able to find information regarding current diagnosis and current use of services for all service

users, including those who made a transition after disengaging with OASIS or after moving outside of the catchment area of the service.

2.6 Demographic variables

Differences between ethnicity categories on the following demographic variables were examined in the UHR sample; age in whole years at the date of referral to the service, gender (male or female), marital status (single,or married/ co-habiting), country of birth (UK or other), and employment status (student, in employment, or unemployed).

2.7 Clinical variables

All people in the UHR group were offered up to 24 sessions of cognitive behaviour therapy (CBT) based on the protocol of French and Morrison (French and Morrison, 2004), delivered by trained clinical psychologists. Second generation antipsychotics and antidepressant medications were prescribed according to medical judgement and person preference. Differences between ethnic groups in the UHR sample on clinical variables were examined including prescription of medication (yes or no), whether the client agreed to cognitive behaviour therapy (CBT; yes or no), and number of CBT session attended. Difference in the source of referrals, whether from primary (for example general practitioner (GP), counsellors or psychological therapists in GP practice or school, self-referral, referral by a relative) or secondary care (for example from an adult or child community mental health team, first episode service, inpatient unit, accident and emergency clinic) was examined by ethnicity. Differences between ethnic groups in UHR symptoms, identified by the CAARMS assessment, was examined. The UHR symptoms were categorised as attenuated symptoms, brief limited intermittent psychosis, or a mixture of the two). Differences between ethnic groups on the Global Assessment of Functioning Scale (Endicott et al., 1976a) were also examined.

2.8 Statistical analyses

When examining differences between ethnic groups on continuous variables, one-way analyses of variance were used. The Kruskal-Wallis non-parametric test was used to examine differences on clinical measures that were not normally distributed or where the sample size was relatively small. Chi-square tests were used for categorical data. Data from the 2011 censuses were used and close age matching to the UHR group was possible (14-35 years). In order to examine if ethnicity was associated with transition to psychosis, Cox proportional hazards regression was used to estimate the hazard ratio associated with risk of transition in the different ethnicity categories after checking for proportional hazards assumptions (Grambsch and Therneau, 1994). The date of entry to the model was the date of referral to the OASIS service and the date of exit was the date of referral plus two years. Data were censored on the date of transition to psychosis or date they were lost to follow-up through emigration or leaving the catchment area, where known. Age and gender were controlled in the models.

3. Results

3.1. Ethnicity

The ethnic composition of the UHR group and the comparable Southwark and Lambeth general population data (Census 2011) are presented in Table 1 along with the FEP sample (based in Lambeth), and the comparable Lambeth general population data (Census 2011).

There was evidence of a difference in the distribution of ethnicity between the UHR sample the background population (χ^2=31, df=33, p<0.001) with an increase in Black ethnicity and fewer White Other and Other ethnicities in the UHR group (Table 1). Compared with the ethnic distribution of the first episode sample, there were fewer people with Black ethnicity and more with White British ethnicity in the UHR group (χ^2=27.63, df =3, p<0.001). There were fewer people

with White British ethnicity, more with Black ethnicity and fewer people with White Other ethnicity in the first episode sample compared to the background population (χ^2=135, df= 3, p<0.001).

Insert Table 1 here.

3.2 Ethnicity and demographics of the UHR

The demographic characteristics of the UHR sample are presented in Table 2 by ethnic group. There were no large differences between the different ethnic groups in terms of age, gender, marital status, or employment. There was a trend (p=0.09) to suggest that there were more males in the White British group (64%) and the Other group (62%), compared to the Black (47%) and White Other (46%) groups. As expected, those of black and other ethnicities were more likely to have been born outside the UK than the White British sample.

Insert Table 2 here

3.3 Ethnicity and clinical features of the UHR

The uptake of treatment was as follows: of the 228 with an UHR: 29 declined any intervention (14% Black (n=11), 11% White British (n=10), 14% White Other (n=4), 12.5% Other (n=4); (χ^2 =0.48, df=3, p=0.96), 4 were referred to another service (4% White Other), 2 were referred back to the referrer with advice (2.5% Black (n=1) and 2% White (n=1). A further 15 agreed to be monitored without engaging in active treatments (12% Black (n=9), 2% White British (n=2), 4% White Other (n=1), 9% Other (n=3); (χ^2 =6.93, df=3, p=0.07).

There were no differences between the different ethnic groups in terms of the source of referral, either from primary or secondary care (Table 3), the category of UHR (attenuated symptoms, brief limited intermittent psychosis, or both), or in global assessment of functioning at baseline. Interestingly, there was a trend (p=0.09) to suggest that antipsychotic medication was more often prescribed to White British people (32%) compared to the other ethnic categories (Black (18%), White Other (18%), Other (16%)). There was also a tendency for antidepressant medication (p=0.06) to be prescribed more often to those in the White British (23%) and White Other (36%) groups compared to the Black group (13%) or the Other group (16%). Engagement in CBT was defined as attending 5 or more sessions compared to fewer than five sessions (Jolley et al., 2015). According to this classification there were no differences between the ethnic groups in engagement with CBT. There was no difference between the ethnic groups in terms of whether at least one of the active treatments (medical or psychological) was accepted (χ^2 =5.08, df=3, p=0.16).

A Kruskall-Wallis non-parametric test revealed a difference between the ethnicity groups in terms of the number of CBT sessions attended (χ^2 =8.83, df= 3, p=0.03). Mann Whitney U post hoc tests revealed some evidence that the White British group attended more CBT sessions than those in the Black (z=-2.20, p=0.03) and Other (z=-2.41, p= 0.02) ethnic groups and a trend towards more than the White Other group (z=-1.93, p=0.054).

Insert Table 3 here.

3.4 Transition rate to psychosis and ethnicity

In total, 33 people made a transition to psychosis within two years of referral to OASIS (23% Black (n=15), 18% White British (n=13), 11% White Other (n=3), and 19% Other (n=2). There was no strong evidence of a difference between the ethnicity groups in rates of transition to psychosis over

the two year period using either the narrow or broad categories of ethnicity (Table 4). Although there was a trend to indicate that those who self-identified as Black African were at highest risk of transitioning to psychosis, however this was not significant (Hazards Ratio (HR) 2.44, 95% CI 0.96-6.24). The survival function at 2 years is shown in Figure 1 for the narrow definition of ethnicity and in Figure 2 for the broad definition.

Insert Figures 1 and 2 here.

4. Discussion

4.1 Methodological considerations

4.1.1 Limitations

Although the sample was catchment area based, we do not know how many people in the general population would fulfil the CAARMS criteria, and the possibility of selection bias cannot therefore be dismissed. Because OASIS is restricted to people who are help seeking, it is possible that the characteristics of those who attend (both in terms of demography and illness factors) are different from those who develop a first episode of psychosis without prior contact with mental health services (Valmaggia et al., 2015).

In terms of the definition of ethnicity, the category 'Other' is a residual category comprised of individuals from disparate minority cultures and those with mixed ethnicity and therefore, the findings in this category are difficult to interpret in any meaningful way.

In this study, the accuracy of the comparison to the general population figures is dependent on the accuracy of the estimates of the denominator from the UK 2011 Census. Although the Census acknowledge difficulties in gathering information from certain groups of people, including those

who live in densely populated urban areas(Office for National Statistics, 2015), a differential bias would need to have been in operation for fewer black people to be identified in the census than lived in the area. The UK 2011 Census included corrections for the possible under-enumeration of particular groups to tackle this problem.

The sample size was relatively small so the power to detect relationships between ethnicity and clinical treatment and outcome variables was limited. Therefore, the findings must be interpreted with caution.

It is possible that the results on transition to FEP could have been biased by differential case ascertainment according to exposure status. Since the BME group was more likely to also be a migrant (non-UK born) group, they might have been more likely to have left the UK to return home to continue care or be closer to family after engagement in OASIS. Therefore, the equal rates of transition observed may have masked a greater rate of transition in the BME groups. This could have led to a failure to detect transition to FEP in the BME group at a greater rate than in the white British group. However, in a recent study (Brandizzi et al 2015) a 100% follow-up rate was achieved in a sample of OASIS clients followed up over 4 years even for those who had disengaged early from the service.

4.1.2 Strengths

Our study has a number of strengths. The high risk sample is unique in that there are no other such samples in South London and this is the first study to examine in detail, ethnic differences at this early stage of illness. We used two comparison groups with similar age distribution to the UHR group, both of which came from the local geographical area. The study was conducted in a naturalistic setting, and the samples were catchment area based. Referrals to the OASIS team were

made through an open referral system, making it inclusive and accessible to all.

4.2 Principal Findings

In support of our first hypothesis, there was an over representation of black services users among those at UHR compared with the background general population. However, there were fewer black service users and more white service users in the UHR group compared to the first episode sample.

In relation to the second hypothesis, while there was no strong evidence of notable differences between the ethnic groups in terms of the uptake of active treatment, we noted some trends in this direction. Although the sample size (N=15) was small, we observed a trend for black services users to refuse active treatment more than white or other service users. Although there was evidence of differences among the different ethnic groups in terms of the number of CBT sessions attended, with a trend for white British service users to attend a greater number of sessions. There was also a trend for antipsychotic and antidepressant medication to be prescribed to more white than black service users.

Concerning the third hypothesis, there were no significant differences in rates of transition to psychosis among the ethnic groups although there was a trend to suggest an increased rate of transition among black Africans.

4.3 Findings in relation to previous studies

The finding of an excess of people from black minority ethnic groups in the UHR sample compared with the background population is consistent with previous findings of increased incidence of psychosis among people from black ethnic minorities (Fearon et al., 2006; Kirkbride et al., 2012),

and an increased rate of psychotic phenomena in black minority groups in general population studies (Johns et al., 2002). However, the finding is in contrast to the findings of Kirkbride and colleagues (Kirkbride et al., 2015), who did not find the over representation of BME status in those at UHR for psychosis. However, their sample was small (n=49), based in a rural and less culturally diverse region, and service users at UHR for psychosis were identified through referrals to at first episode team. Our findings suggest that factors related to minority ethnic status increase the risk of psychosis and psychotic phenomena in the absence of a formal psychotic disorder. Many studies from around the world have shown that processes associated with migration and immigration appear to increase the risk of psychosis in a diversity of ethnic groups (Cantor-Graae and Selten, 2005b). It has been suggested that this may be related to effects of stress and social defeat (Selten and Cantor-Graae, 2005) , perceived discrimination (Janssen et al., 2003), childhood social deprivation (Hjern et al., 2004b; Wicks et al., 2005), childhood separation from parents (Morgan et al., 2007), and neighbourhood characteristics such as ethnic density (Boydell et al., 2001). It has also been suggested that environmental risks for psychosis act additively, and that "the level of environmental risk combines synergistically with non-clinical developmental expression of psychosis to cause abnormal persistence and, eventually, need for care" (Cougnard et al., 2007). High level of area crime and low level of education were identified as predictors of incidence of first episode of psychosis in Lambeth, an ethnically diverse urban area in South London where this study was based, after controlling for the effects of age, gender, ethnicity, and population density (Bhavsar et al., 2014). In addition, single-parent households, ethnic diversity, and multiple deprivation at neighbourhood level were associated with both risk for developing at risk mental states and FEP (Kirkbride et al., 2015).

The finding that a mental health service for people at UHR was successful at engaging people from ethnic minorities suggests that early detection services can reach and be acceptable to this

population. Nevertheless, the even higher proportion of black people among the first episode sample than the UHR group suggests some individuals from minority groups who are at UHR for psychosis may not present to services until after the onset of frank psychosis. This may reflect a difficulty in help-seeking at an early stage that could reflect negative beliefs about mental health services (Sainsbury Centre for Mental Health, 2002) or alternative personal explanations for prodromal psychotic experiences among minority groups. Generally, there is some evidence that there is relatively equitable utilization of care across ethnic groups at GP level (Dixon et al., 2007; Morris et al., 2005) while those from ethnic minorities are less likely to utilise secondary care and specialist services (Morris et al., 2005). However, it has been shown that those from black Caribbean and black Other groups are less likely to be referred by a GP and are more likely to enter the mental health system through the police or criminal justice system (Commission for Healthcare Audit and Inspection, 2007). These findings suggest that there may be different pathways to care across the stages of illness. Interestingly, in a local Increased Access to Psychological Therapies (IAPT) for common mental illnesses (anxiety and depression) team, it was noted that having a self-referral pathway increased access to psychological therapy for people of black and minority ethnic groups in the London Borough of Southwark (Brown et al., 2014), an area from which 32% of the OASIS referrals came. Our findings may also in part reflect the fact that the majority of the young people from ethnic minorities who seek help from OASIS were born in the UK.

We found remarkably few differences in the uptake of treatment between ethnic groups. This is in contrast to findings that among people with established psychosis, African-Caribbean's were less likely to receive psychotherapy compared to white British people (Das-Munshi et al., 2018; McKenzie et al., 2001), were less likely to be prescribed second generation antipsychotic drugs (Kuno and Rothbard, 2002; Mallinger et al., 2006) and had higher drop-out rates from CBTp have been identified for African Caribbean and black African people (Rathod et al., 2005). However,

within the package of treatment offered, those with White British ethnicity engaged in significantly more sessions of CBT than did people with other ethnicity. Additionally, there was a trend for increased rates of prescription of antidepressant and antipsychotic medication in the White British group. There was also a suggestion that black service users were more likely than other service users to refuse active treatment, although this must be interpreted with caution because of the small sample size involved in this calculation. However, these findings suggest differences in service provision and raise a number of issues. Given that there is evidence that CBT might prevent or delay transition to psychosis (Morrison et al., 2007), it would seem important to optimally engage people with an at risk mental state in CBT. We are unsure why white service users engaged in more sessions of CBT than the other groups. The factors influencing engagement include factors related to the person, their beliefs about their symptoms (Codjoe et al., 2013), their views about involvement with mental health teams, and their experience of the service. It is likely that people have different models of understanding, coping with, and recovering from mental health problems, and some might prefer a briefer period of talking therapy than others. In terms of service factors, it is important to ensure that the service is delivered in a culturally sensitive way and is matched to individual needs and expectations. We cannot rule out that factors operating at a service level have influenced the differences in service provision and engagement suggested in our findings. In the future, it would be helpful to focus on service users experience of the service and treatments offered in order to ensure maximum acceptability of treatments to all service users. However, the average number of sessions attended by each of the ethnicity categories was close to the number of sessions (n=16) of CBT recommended by the National Institute for Health and Care Excellence for young people with psychosis (National Institute for Health and Care Excellence, 2013).

In this sample, and previously reported (Valmaggia et al., 2015), black service users at UHR were no more likely to make a transition to psychosis than those with white British ethnicity. Given the

greater than 6-fold higher incidence of psychosis among black people from the same geographical area who have not received mental health care prior to the onset of illness (Fearon et al., 2006), this raises the possibility that providing mental health care to people when they are in a high risk phase may help to reduce the risk of subsequent psychosis in these vulnerable groups. While the mechanisms underlying the association between ethnicity and the incidence of psychosis are unclear, a reduction of this effect in the high risk phase would implicate risk factors that are operational in early adulthood, such as social discrimination (Veling et al., 2007). While there is some evidence to suggest that intervention in the UHR phase can reduce the risk of psychosis (Morrison et al., 2007), whether intervention can reduce the influence of particular factors, or its effectiveness is related to ethnicity has yet to be investigated. Moreover, because the number of people in our sample who made a transition was relatively small, we cannot exclude the possibility that we were unable to detect a true difference in the rate of transition in different ethnic groups because of limited statistical power. This is supported by the exploratory finding that those with black African ethnicity showed a trend towards increased risk for transition to psychosis (OR 2.44; 95% CI 0.96-6.24) compared to the white British group, although this must be interpreted with caution because of the modest sample size. In addition, ethnicity was recently identified as a robust predictor of pretest risk enrichment in a sample of 710 individuals referred to the OASIS service for assessment over a 13 year period (Fusar-Poli et al., 2016b). It is also possible that people who develop psychosis after contacting early detection services represent a different subpopulation from those who develop a first episode psychosis without having prior contact with mental health services. Either way, engagement in mental health services at this early stage can have a positive impact on the trajectories of those who go on to develop psychosis, reducing duration of untreated psychosis and length of hospital stay(Valmaggia et al., 2015). This highlights the importance of early engagement in vulnerable groups. A recent study involving a large sample from the same geographical area as the present study found that people who had contacted OASIS before the first

episode were more likely to be young, male, and have a schizophreniform psychosis than those who presented with psychosis without prior contact (Fusar-Poli et al., 2016a).

5. Conclusions

Our findings are in line with studies of first episode psychosis in the local area, and general population studies, which have shown an increase in psychosis and psychotic symptoms among people from black ethnic minorities. Our data suggest that people from ethnic minority groups can access UHR services and engage in treatment. They also provide an indication that delivering treatment at this stage may provide a means of reducing the differences in the incidence of psychosis between ethnic groups, although this would need to be replicated in a larger sample.

Acknowledgments
Our special thanks go to the staff and service users of OASIS and LEO-CAT.

Declaration of Interests

None. Funding detailed in Financial Support.

Financial Support

The work was supported by the Mental Health Foundation and Guy's and St Thomas' Charitable Foundation (PI: Valmaggia). The authors acknowledge financial support from the National Institute for Health Research (NIHR) Biomedical Research Centre for Mental Health at South London and Maudsley NHS Foundation Trust and King's College London. The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health. The funders had no input into any aspect of the design of the study, the collection, analysis, and interpretation of the data, the written manuscript, or the decision about where to submit the article.

Contributors

Majella Byrne wrote the manuscript, was involved in the data collection, conducted the data analysis, and interpreted the data. Louisa Codjoe contributed to manuscript revisions and was involved in data collection. Craig Morgan contributed to the data analysis and interpretation and to manuscript revisions. Daniel Stahl offered statistical advice on the project. Fern Day was involved in data collection and contributed to manuscript revisions. Paul Fearon contributed to the interpretation of the data and to manuscript revisions. Paolo Fusar-Poli was involved in data collection, interpretation of the analysis and contributed to manuscript revisions. Paddy Power provided the comparison data from the Lambeth Early Onset Service and contributed to manuscript revisions. Philip McGuire secured funding for the project, was involved in the study design, data analysis, and interpretation of the data and contributed to manuscript revisions. Lucia Valmaggia

secured funding for the project, was involved in the study design, data collection, data analysis, and was responsible for the integrity of the data, she also read and contributed to manuscript revisions.

Conflict of Interest

None

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008."

References

Anderson, K.K., Flora, N., Archie, S., Morgan, C., McKenzie, K., 2014. A meta-analysis of ethnic differences in pathways to care at the first episode of psychosis. Acta Psychiatr Scand 130 (4), 257-268.

Bhavsar, V., Boydell, J., Murray, R., Power, P., 2014. Identifying aspects of neighbourhood deprivation associated with increased incidence of schizophrenia. Schizophr Res 156 (1), 115-121.

Boydell, J., van, O.J., McKenzie, K., Allardyce, J., Goel, R., McCreadie, R.G., et al., 2001. Incidence of schizophrenia in ethnic minorities in London: ecological study into interactions with environment. BMJ 323 (7325), 1336-1338.

Brandizzi, M., Valmaggia, L., Byrne, M., Jones, C., Iwegbu, N., Badger, S., et al., 2015. Predictors of functional outcome in individuals at high clinical risk for psychosis at six years follow-up. J Psychiatr Res 65, 115-123.

Broome, M.R., Woolley, J.B., Tabraham, P., Johns, L.C., Bramon, E., Murray, G.K., et al., 2005. What causes the onset of psychosis? Schizophr.Res. 79 (1), 23-34.

Brown, J.S., Ferner, H., Wingrove, J., Aschan, L., Hatch, S.L., Hotopf, M., 2014. How equitable are psychological therapy services in South East London now? A comparison of referrals to a new psychological therapy service with participants in a psychiatric morbidity survey in the same London borough. Soc Psychiatry Psychiatr Epidemiol 49 (12), 1893-1902.

Cantor-Graae, E., Selten, J.P., 2005a. Schizophrenia and migration: a meta-analysis and review. Am J Psychiatry 162 (1), 12-24.

Cantor-Graae, E., Selten, J.P., 2005b. Schizophrenia and migration: a meta-analysis and review. Am.J.Psychiatry 162 (1), 12-24.

Codjoe, L., Byrne, M., Lister, M., McGuire, P., Valmaggia, L., 2013. Exploring perceptions of "wellness" in black ethnic minority individuals at risk of developing psychosis. Behav Cogn Psychother 41 (2), 144-161.

Commission for Healthcare Audit and Inspection, 2007. Count me in 2007. Healthcare Commission.

Corcoran, C.M., 2016. Ethical and Epidemiological Dimensions of Labeling Psychosis Risk. AMA J Ethics 18 (6), 633-642.

Cougnard, A., Marcelis, M., Myin-Germeys, I., De Graaf, R., Vollebergh, W., Krabbendam, L., et al., 2007. Does normal developmental expression of psychosis combine with environmental risk to cause persistence of psychosis? A psychosis proneness-persistence model. Psychol.Med. 37 (4), 513-527.

Craig, T.K., Garety, P., Power, P., Rahaman, N., Colbert, S., Fornells-Ambrojo, M., et al., 2004. The Lambeth Early Onset (LEO) Team: randomised controlled trial of the effectiveness of specialised care for early psychosis. BMJ 329 (7474), 1067.

Das-Munshi, J., Bhugra, D., Crawford, M.J., 2018. Ethnic minority inequalities in access to treatments for schizophrenia and schizoaffective disorders: findings from a nationally representative cross-sectional study. BMC Med 16 (1), 55.

Davies, S., Thornicroft, G., Leese, M., Higgingbotham, A., Phelan, M., 1996. Ethnic differences in risk of compulsory psychiatric admission among representative cases of psychosis in London. BMJ 312 (7030), 533-537.

Dixon, A., Le Grand, J., Henderson, J., Murray, R., Poteliakhoff, E., 2007. Is the British National Health Service equitable? The evidence on socioeconomic differences in utilization. Journal of Health Services Research Policy 12 (2), 104-109.
Endicott, J., Spitzer, R.L., Fleiss, J.L., Cohen, J., 1976a. The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. Arch Gen Psychiatry 33 (6), 766-771.
Endicott, J., Spitzer, R.L., Fleiss, J.L., Cohen, J., 1976b. The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. Arch.Gen.Psychiatry 33 (6), 766-771.
Fearon, P., Kirkbride, J.B., Morgan, C., Dazzan, P., Morgan, K., Lloyd, T., et al., 2006. Incidence of schizophrenia and other psychoses in ethnic minority groups: results from the MRC AESOP Study. Psychol.Med. 36 (11), 1541-1550.
French, P., Morrison, A.P., 2004. Early Detection and Cognitive Therapy for People at High Risk for Psychosis. John Wiley and Sons, Chichester.
Fusar-Poli, P., Byrne, M., Badger, S., Valmaggia, L.R., McGuire, P.K., 2013. Outreach and support in south London (OASIS), 2001-2011: ten years of early diagnosis and treatment for young individuals at high clinical risk for psychosis. Eur Psychiatry 28 (5), 315-326.
Fusar-Poli, P., Diaz-Caneja, C.M., Patel, R., Valmaggia, L., Byrne, M., Garety, P., et al., 2016a. Services for people at high risk improve outcomes in patients with first episode psychosis. Acta Psychiatr Scand 133 (1), 76-85.
Fusar-Poli, P., Rutigliano, G., Stahl, D., Schmidt, A., Ramella-Cravaro, V., Hitesh, S., et al., 2016b. Deconstructing Pretest Risk Enrichment to Optimize Prediction of Psychosis in Individuals at Clinical High Risk. J.A.M.A. Psychiatry 73 (12), 1260-1267.
Gajwani, R., Parsons, H., Birchwood, M., Singh, S.P., 2016. Ethnicity and detention: are Black and minority ethnic (BME) groups disproportionately detained under the Mental Health Act 2007? Soc Psychiatry Psychiatr Epidemiol 51 (5), 703-711.
Ghali, S., Fisher, H.L., Joyce, J., Major, B., Hobbs, L., Soni, S., et al., 2013. Ethnic variations in pathways into early intervention services for psychosis. Br J Psychiatry 202 (4), 277-283.
Grambsch, P., Therneau, T., 1994. Proportional hazards tests and diagnostics based on weighted residuals. Biometrika 81, 515-526.
Harrison, G., Glazebrook, C., Brewin, J., Cantwell, R., Dalkin, T., Fox, R., et al., 1997. Increased incidence of psychotic disorders in migrants from the Caribbean to the United Kingdom. Psychol.Med. 27 (4), 799-806.
Harrison, G., Holton, A., Neilson, D., Owens, D., Boot, D., Cooper, J., 1989. Severe mental disorder in Afro-Caribbean patients: some social, demographic and service factors. Psychol.Med. 19 (3), 683-696.
Health Care Commission, 2006. Count me in census 2006., London.
Henderson, C., Corker, E., Lewis-Holmes, E., Hamilton, S., Flach, C., Rose, D., et al., 2012. England's time to change antistigma campaign: one-year outcomes of service user-rated experiences of discrimination. Psychiatr Serv 63 (5), 451-457.
Hjern, A., Wicks, S., Dalman, C., 2004a. Social adversity contributes to high morbidity in psychoses in immigrants--a national cohort study in two generations of Swedish residents. Psychol Med 34 (6), 1025-1033.
Hjern, A., Wicks, S., Dalman, C., 2004b. Social adversity contributes to high morbidity in psychoses in immigrants--a national cohort study in two generations of Swedish residents. Psychol.Med. 34 (6), 1025-1033.
Janssen, I., Hanssen, M., Bak, M., Bijl, R.V., De Graaf, R., Vollebergh, W., et al., 2003. Discrimination and delusional ideation. Br.J.Psychiatry 182, 71-76.
Johns, L.C., Nazroo, J.Y., Bebbington, P., Kuipers, E., 2002. Occurrence of hallucinatory experiences in a community sample and ethnic variations. Br.J.Psychiatry 180, 174-178.

Jolley, S., Garety, P., Peters, E., Fornells-Ambrojo, M., Onwumere, J., Harris, V., et al., 2015. Opportunities and challenges in Improving Access to Psychological Therapies for people with Severe Mental Illness (IAPT-SMI): evaluating the first operational year of the South London and Maudsley (SLaM) demonstration site for psychosis. Behav Res Ther 64, 24-30.

Kirkbride, J.B., Errazuriz, A., Croudace, T.J., Morgan, C., Jackson, D., Boydell, J., et al., 2012. Incidence of schizophrenia and other psychoses in England, 1950-2009: a systematic review and meta-analyses. PLoS One 7 (3), e31660.

Kirkbride, J.B., Hameed, Y., Ioannidis, K., Ankireddypalli, G., Crane, C.M., Nasir, M., et al., 2017. Ethnic Minority Status, Age-at-Immigration and Psychosis Risk in Rural Environments: Evidence From the SEPEA Study. Schizophr Bull 43 (6), 1251-1261.

Kirkbride, J.B., Stochl, J., Zimbron, J., Crane, C.M., Metastasio, A., Aguilar, E., et al., 2015. Social and spatial heterogeneity in psychosis proneness in a multilevel case-prodrome-control study. Acta Psychiatr Scand 132 (4), 283-292.

Kuno, E., Rothbard, A.B., 2002. Racial disparities in antipsychotic prescription patterns for patients with schizophrenia. Am J Psychiatry 159 (4), 567-572.

Leao, T.S., Sundquist, J., Frank, G., Johansson, L.M., Johansson, S.E., Sundquist, K., 2006. Incidence of schizophrenia or other psychoses in first- and second-generation immigrants: a national cohort study. J Nerv Ment Dis 194 (1), 27-33.

Mallinger, J.B., Fisher, S.G., Brown, T., Lamberti, J.S., 2006. Racial disparities in the use of second-generation antipsychotics for the treatment of schizophrenia. Psychiatr Serv 57 (1), 133-136.

McKenzie, K., Samele, C., Van Horn, E., Tattan, T., Van Os, J., Murray, R., 2001. Comparison of the outcome and treatment of psychosis in people of Caribbean origin living in the UK and British Whites. Report from the UK700 trial. Br J Psychiatry 178, 160-165.

Moffat, J., Sass, B., McKenzie, K., Bhui, K., 2009. Improving pathways into mental health care for black and ethnic minority groups: a systematic review of the grey literature. Int Rev Psychiatry 21 (5), 439-449.

Morgan, C., Kirkbride, J., Leff, J., Craig, T., Hutchinson, G., McKenzie, K., et al., 2007. Parental separation, loss and psychosis in different ethnic groups: a case-control study. Psychol.Med. 37 (4), 495-503.

Morgan, C., Mallett, R., Hutchinson, G., Bagalkote, H., Morgan, K., Fearon, P., et al., 2005a. Pathways to care and ethnicity. 1: Sample characteristics and compulsory admission. Report from the AESOP study. Br.J.Psychiatry 186, 281-289.

Morgan, C., Mallett, R., Hutchinson, G., Bagalkote, H., Morgan, K., Fearon, P., et al., 2005b. Pathways to care and ethnicity. 2: Source of referral and help-seeking. Report from the AESOP study. Br.J.Psychiatry 186, 290-296.

Morris, S., Sutton, M., Gravelle, H., 2005. Inequity and inequality in the use of health care in England: an empirical investigation. Soc.Sci.Med. 60 (6), 1251-1266.

Morrison, A.P., French, P., Parker, S., Roberts, M., Stevens, H., Bentall, R.P., et al., 2007. Three-Year Follow-up of a Randomized Controlled Trial of Cognitive Therapy for the Prevention of Psychosis in People at Ultrahigh Risk. Schizophr. Bull. 33 (3), 682-687.

National Institute for Health and Care Excellence, 2013. Psychosis and schizophrenia in children and young people: recognition and management (CG155) National Collaborating Centre for Mental Health, London.

National Institute of Health and Care Excellence, 2014. Psychosis and schizophrenia in adults: prevention and management: NICE Guidlines CG178. NICE.

Office for National Statistics, 2015. 2011 Census General Report for England and Wales.

Power, P., Iacoponi, E., Reynolds, N., Fisher, H., Russell, M., Garety, P.A., et al., 2007. The Lambeth Early Onset Crisis Assessment Team Study: general practitioner education and

access to an early detection team in first-episode psychosis. The British Journal of Psychiatry 191 (51), s133-s139.
Rathod, S., Kingdon, D., Smith, P., Turkington, D., 2005. Insight into schizophrenia: the effects of cognitive behavioural therapy on the components of insight and association with sociodemographics--data on a previously published randomised controlled trial. Schizophr Res 74 (2-3), 211-219.
Rwegellera, G.G., 1980. Differential use of psychiatric services by West Indians, West Africans and English in London. Br.J.Psychiatry 137, 428-432.
Sainsbury Centre for Mental Health, 2002. Breaking the Circles of Fear: A review of the relationship between mental health services and the African and Caribbean communities. Sainsbury Centre for Mental Health, London.
Selten, J.P., Cantor-Graae, E., 2005. Social defeat: risk factor for schizophrenia? Br.J.Psychiatry 187, 101-102.
Tortelli, A., Errazuriz, A., Croudace, T., Morgan, C., Murray, R.M., Jones, P.B., et al., 2015. Schizophrenia and other psychotic disorders in Caribbean-born migrants and their descendants in England: systematic review and meta-analysis of incidence rates, 1950-2013. Soc Psychiatry Psychiatr Epidemiol 50 (7), 1039-1055.
Valmaggia, L.R., Byrne, M., Day, F., Broome, M.R., Johns, L., Howes, O., et al., 2015. Duration of untreated psychosis and need for admission in patients who engage with mental health services in the prodromal phase. Br J Psychiatry 207 (2), 130-134.
Veling, W., Selten, J.P., Susser, E., Laan, W., Mackenbach, J.P., Hoek, H.W., 2007. Discrimination and the incidence of psychotic disorders mong ethnic minorities in The Netherlands. Int.J.Epidemiol. 36 (4), 761-768.
Wicks, S., Hjern, A., Gunnell, D., Lewis, G., Dalman, C., 2005. Social adversity in childhood and the risk of developing psychosis: a national cohort study. Am.J.Psychiatry 162 (9), 1652-1657.
Yung, A.R., Phillips, L.J., McGorry, P.D., McFarlane, C.A., Francey, S., Harrigan, S., et al., 1998. Prediction of psychosis. A step towards indicated prevention of schizophrenia. Br J Psychiatry Suppl 172 (33), 14-20.
Yung, A.R., Yuen, H.P., McGorry, P.D., Phillips, L.J., Kelly, D., Dell'Olio, M., et al., 2005. Mapping the onset of psychosis: the Comprehensive Assessment of At-Risk Mental States. Aust N Z J Psychiatry 39 (11-12), 964-971.

Table 1. Ethnic distribution of the UHR, first episode and background population; 16-34 years.

Ethnicity	UHR Frequency (%) *N*=207 Southwark and Lambeth	Southwark and Lambeth Census 2011 (%)[1] *N*=225, 945	UHR vs Census 2011 Absolute difference in proportions (95% confidence Intervals)[2]	FEP Frequency (%) *N*=146	UHR vs FEP Absolute difference in proportions (95% confidence Intervals) [2]	Lambeth Borough ethnicity Census 2011 (%) *N*=117, 945	FEP vs Census 2011 (Lambeth) Absolute difference in proportions (95% confidence Intervals) [2]
White British	82 (40)	89, 545 (40)	0% (-6.68, 6.65)	24 (16)	-23% (-32.15, -14.20)	49, 493 (42)	-26% (-31.54, -19.51)
Black	71 (34)	44, 942 (21)	14% (7.94, 20.88)	84 (58)	23% (12.93, 33.54)	22, 416 (19)	39% (30.51, 46.55)
White Other	26 (13)	46, 411 (21)	-8% (-12.50, -3.46)	16 (11)	-2% (-8.39, -5.18)	25, 693 (22)	-11% (-15.90, -5.75)
Other	28 (13)	45, 047 (20)	-7% (-11.07, -1.75)	22 (15)	2% (-5.90, 8.98)	20,343 (17)	-2% (-7.99, 3.63)

[1]Percentages rounded to remove decimal places.

[2] Absolute difference in the proportions (%) of each ethnic group between the samples with 95% confidence intervals ().

Table 2 Demographics by ethnicity in the UHR group

	Black[1] ***N*=77** **Mean (SD)**	**White British[2]** ***N*=91** **Mean (SD)**	**White Other[3]** ***N*=28** **Mean (SD)**	**Other[4]** ***N*=32** **Mean (SD)**	**Statistical test results**
Age	23.15 (4.84)	22.5 (4.3)	24.9 (5.0)	23.2 (4.6)	F=1.84, df= 3,224, p=0.14
	***N* (%)**	***N* (%)**	***N* (%)**	***N* (%)**	
Gender					
Male	36 (47)	58 (64)	13 (46)	20 (62)	χ^2=6.45, df= 3, p= 0.09
Female	41 (53.2)	33 (36)	15 (54)	12 (38)	
Marital Status					
Single	62 (82)	72 (80)	22 (79)	28 (87)	χ^2 =1.05, df= 3, p=0.79
Not Single	14 (18)	18 (20)	6 (21)	4 (13)	
Country of birth					
UK	53 (69)	91 (100)	12 (43)	21 (66)	χ^2 =51.8, df= 3, p<0.001
Non-UK	24 (31)	0 (0)	16 (57)	11 (44)	
Employment status					
Student	16 (21)	25 (28)	6 (21)	13 (41)	
Employed	23 (30)	25 (28)	11 (39)	9 (28)	χ^2 =6.3, df= 6, p=0.39
Unemployed	37 (49)	40 (44)	11 (39)	10 (31)	

[1]=Black British, Black African, Black Carribean

[2]=White British

[3]=White Other

[4]=Asian Oriental, Asian Indian, Middle-East Arab, Mixed

Table 3. Ethnic groups compared on clinical variables in the UHR sample

	Black ***N*=77**	**White British** ***N*=91**	**White Other** ***N*=28**	**Other** ***N*=32**	**Test statistic[1]**
Assessment phase	***N* (%)**	***N* (%)**	***N* (%)**	***N* (%)**	***Chi-Square***
Source of referral					
Primary Care	32 (42)	36 (40)	10 (36)	15 (47)	χ^2 =0.86, df= 3, *p*=0.83
Secondary Care	45 (58)	55 (60)	18 (64)	17 (53)	
Category of UHR					
Attenuated symptoms	62 (81)	73 (80)	24 (86)	28 (88)	
BLIP	8 (10)	10 (11)	2 (7)	2 (6)	χ^2 =1.33, df= 6, *p*=0.97
Mixed AS, Blip	7 (9)	8 (9)	2 (7)	2 (6)	
Clinical measures	**Median (25th, 75th Percentile)**	**Median (25 th, 75 th Percentile)**	**Median (25 th, 75 th Percentile)**	**Median (25 th, 75 th Percentile)**	***Kruskal-Wallis One-way ANOVA[1]***
Global Assessment of Functioning (GAF; n=205)	60 (53, 65) *N*=65	55 (50, 65) *N*=84	60 (51, 65) *N*=26	60 (50, 61) *N*=30	χ^2=1.34, df=3, *p*=0.72

Table 3. Ethnic groups compared on clinical variables in the UHR sample Continued.

	Black ***N*=77**	**White British** ***N*=91**	**White Other** ***N*=28**	**Other** ***N*=32**	**Test statistic[1]**
Intervention Phase	***N* (%)**	***N* (%)**	***N* (%)**	***N* (%)**	***Chi-square***
Antipsychotics prescribed (n=228)					
Yes	14 (18)	29 (32)	5 (18)	5 (16)	
No	63 (82)	62 (68)	23 (82)	27 (84)	χ^2 =6.40, df= 3, *p*=0.09
Antidepressants prescribed (n=228)					
Yes	10 (13)	21 (23)	10 (36)	5 (16)	
No	67 (87)	70 (77)	18 (64)	27 (84)	χ^2 =7.56, df= 3, *p*=0.06
Cognitive Behavioural Therapy (CBT 5 or more sessions; n=159)[3]					
Yes	39 (87)	60 (90)	19 (79)	21 (91)	
No	6 (13)	7 (10)	5 (21)	2 (9)	χ^2 =2.10, df= 3, *p*=0.55
Number of CBT session (n=159)[3]	*N*=45	*N*=67	*N*=24	*N*=23	
Mean (SD)	16.5 (14.6)	20 (11.0)	15 (8.0)	14 (7.6)	χ^2 =8.83, df= 3, *p*=0.03[4]
Median (25th percentile, 75th percentile)	14 (6, 24)	20 (12, 27)	15.5 (7, 22)	13 (7, 21)	
At least one active intervention (antipsychotic, antidepressant, or CBT; n=228)					χ^2 =5.08, df= 3, *p*=0.16
Yes	51 (66)	71 (78)	20 (71)	27 (84)	
No	26 (34)	20 (22)	8 (29)	5 (16)	

Table 3. Ethnic groups compared on clinical variables in the UHR sample Continued.

	Black ***N*=77**	**White British** ***N*=91**	**White Other** ***N*=28**	**Other** ***N*=32**	**Test statistic[1]**
Outcome	***N (%)***	***N (%)***	***N (%)***	***N (%)***	
Transition to Psychosis in the total time period					
Yes (n=43)	18 (23)	16 (18)	3 (11)	6 (19)	χ^2 =3.67, df= 3, *p*=0.30[2]
No (n=185)	59 (77)	75 (82)	25 (89)	26 (81)	

[1]=Analysis based on the valid number of cases

[2]= Kaplan Meier Log Rank test based on transition at 2 years (*n*=33).

[3]=Information on number of CBT sessions was unreliable for 24 people referred in the early years of the project, prior to the current electronic patient record system which tracks therapy activity; a further 45 people did not engage in CBT therapy.

[4]Mann Whitney U post hoc tests revealed that the White British group engaged in significantly more sessions than the Black (z=-2.20, *p*=0.03) and Other group (z=-2.41, *p*= 0.02) with a trend to more than the white other group (z=-1.93, *p*=0.054).

Table 4. Cox Proportional Hazard model for the association between ethnicity and 2 year transition to psychosis in those at UHR

Ethnic Group (Narrow)	**Model 1[1,3]**	**Ethnic Group (Broad)**	**Model 2[2,3]**
	Hazard Ratio (95% CI)		**Hazard Ratio (95% CI)**
White British *N*=91	Reference (1)	**White British *N*=91**	Reference (1)
Black *N*=77	1.38 (0.65-2.93)	**Black British *N*=40**	1.24 (0.49-3.11)
White Other *N*=28	0.70 (0.19-2.50)	**Black African *N*=22**	2.44 (0.96-6.24)
Other *N*=32	0.40 (0.10-1.78)	**Black Caribbean *N*=15**	0.42 (0.05-3.28)
		White Other *N*=28	0.70 (0.20-2.52)
		Mixed *N*=15	0.38 (0.05-2.89)
		Other *N*=17	0.43 (0.06-3.31)

[1]-2 log likelihood ratio 349.27 (χ^2=3.82, df= 5, p=0.57)

[2]-2 log likelihood ratio 345.14 (χ^2=9.39, df= 8, p=0.31)

[3] The model was adjusted for gender and age, neither of which, was a significant factor in the model.

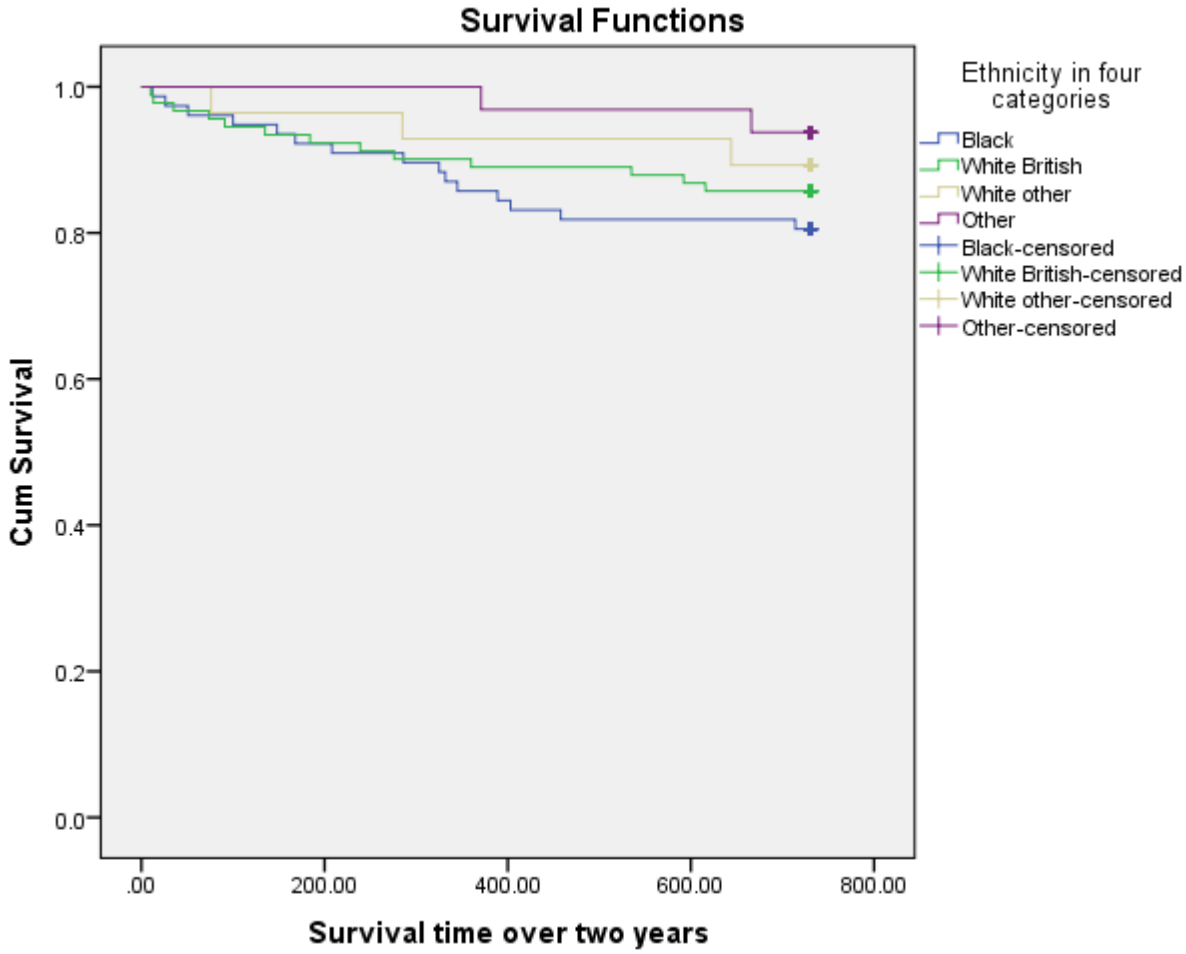

Figure 1. Survival function at two years for the different ethnic groups (narrowly categorised).

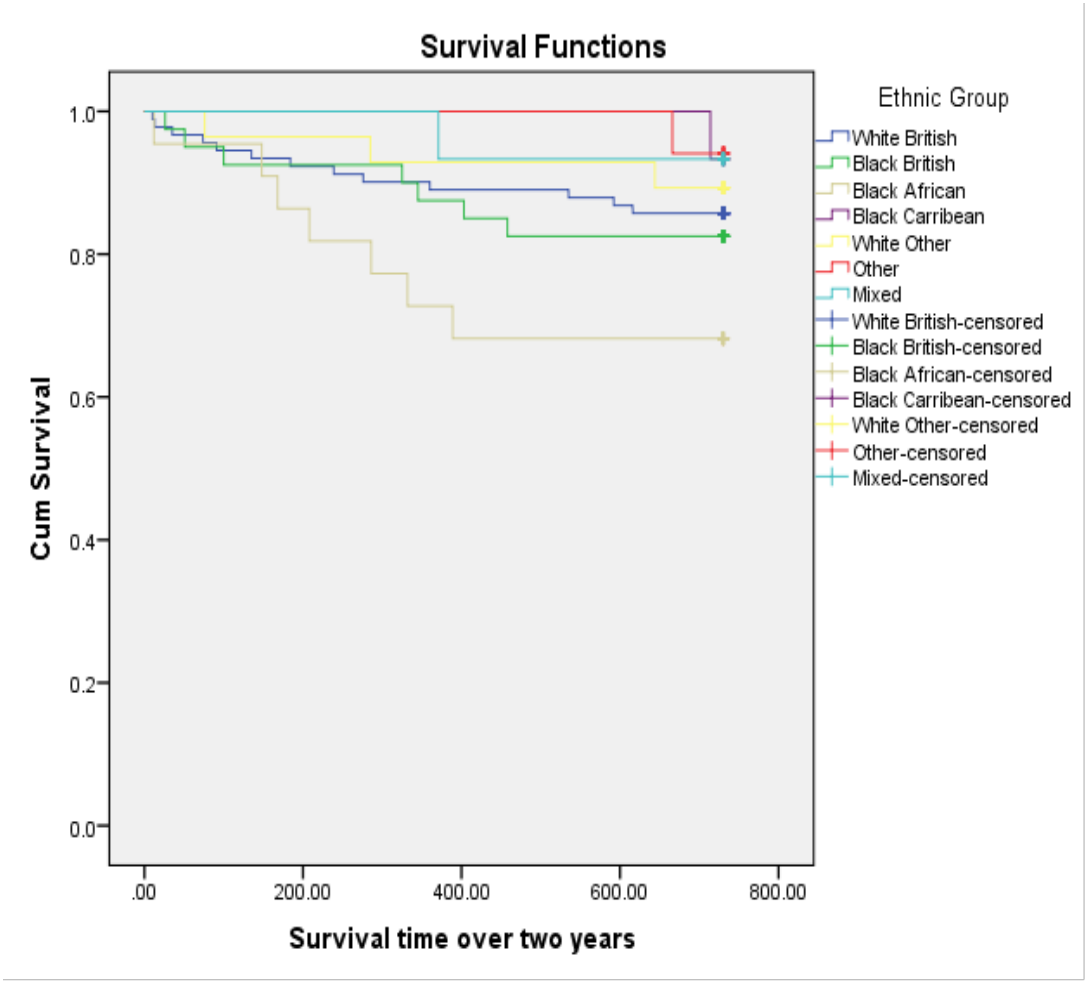

Figure 2. Survival function at two years for the different ethnic group (broadly categorised).